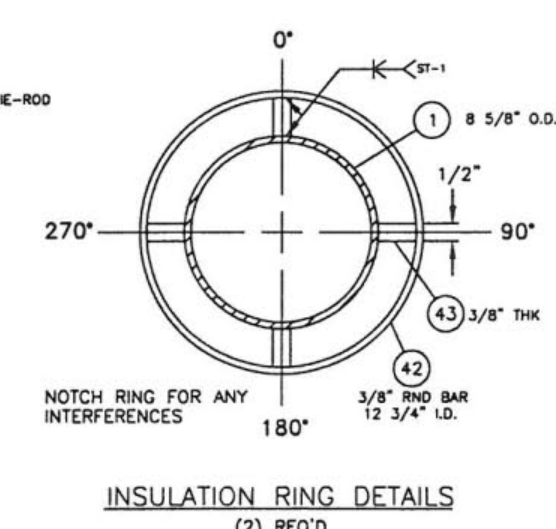
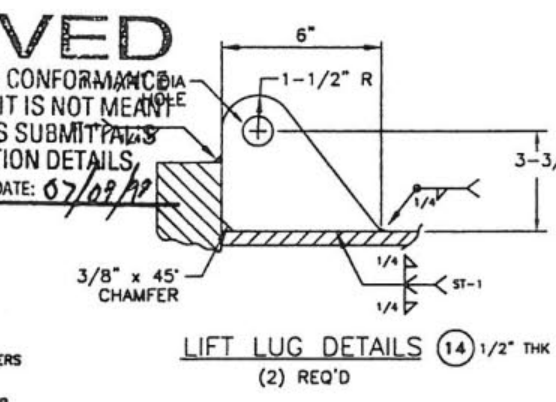
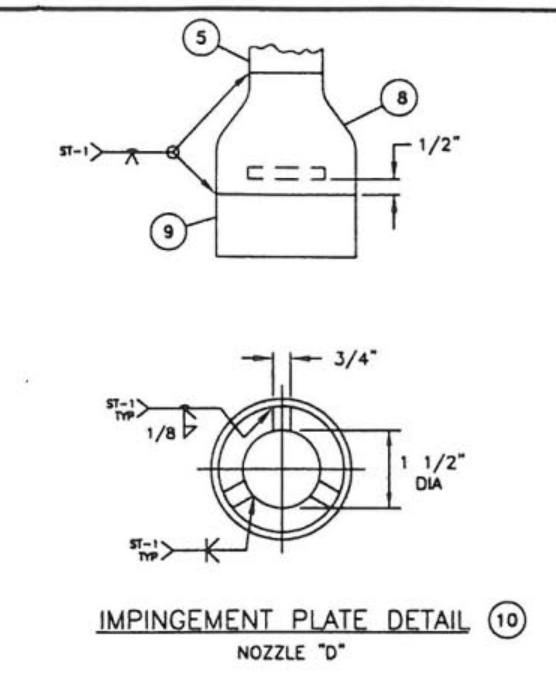
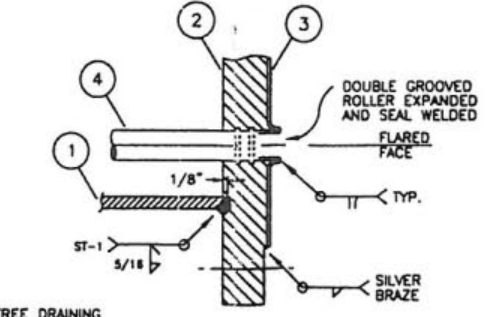
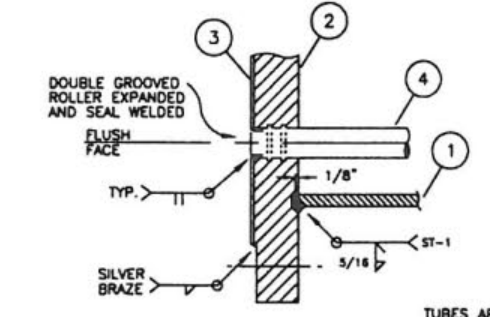
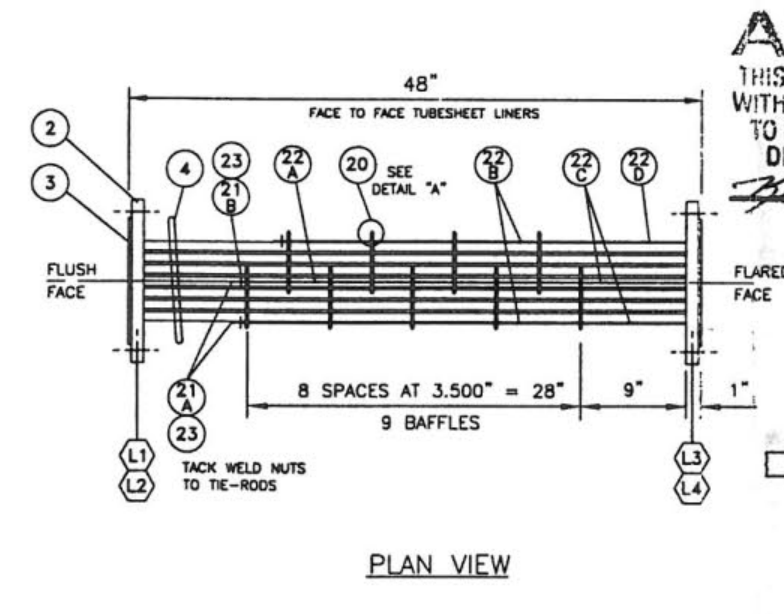
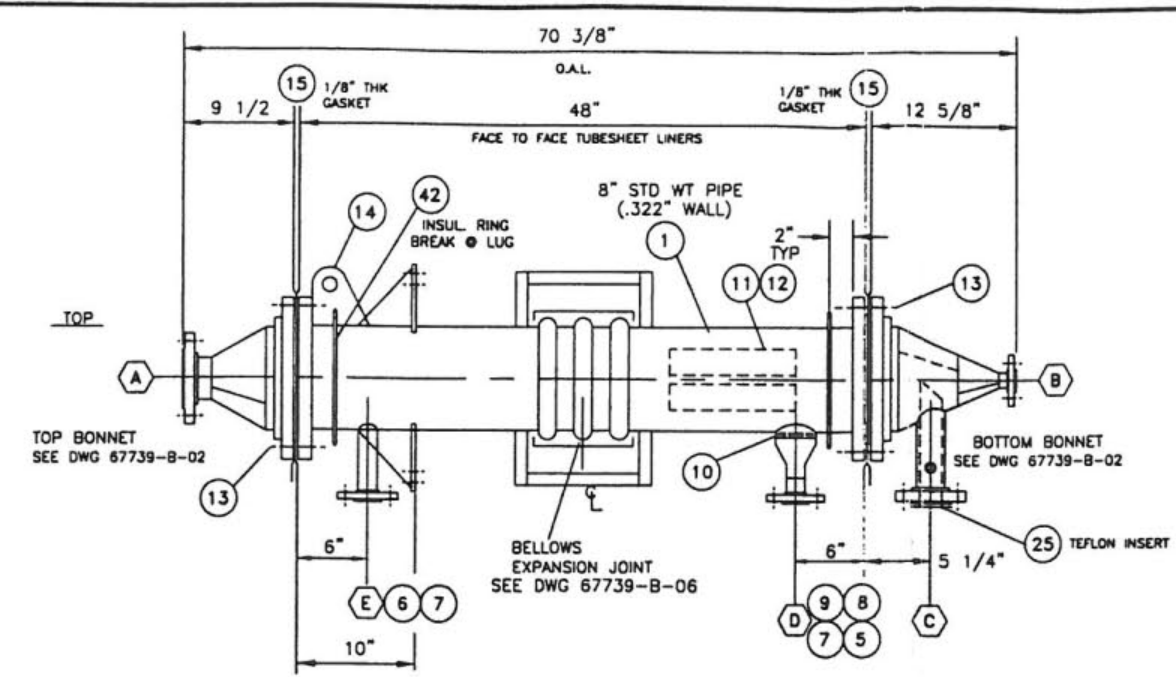
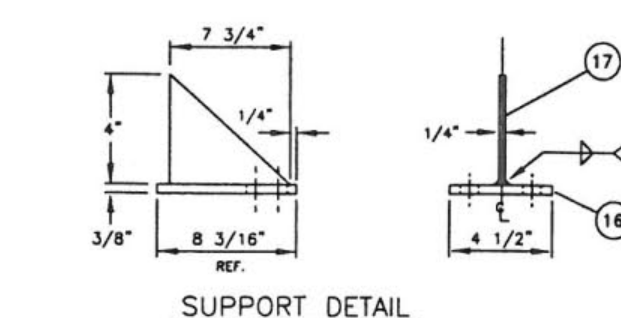
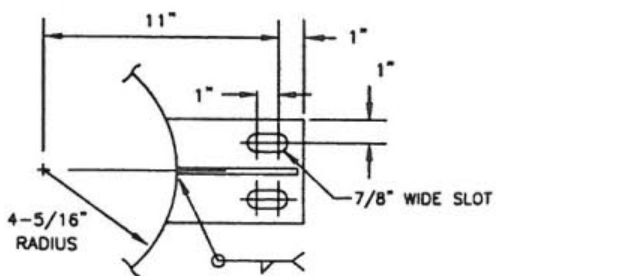
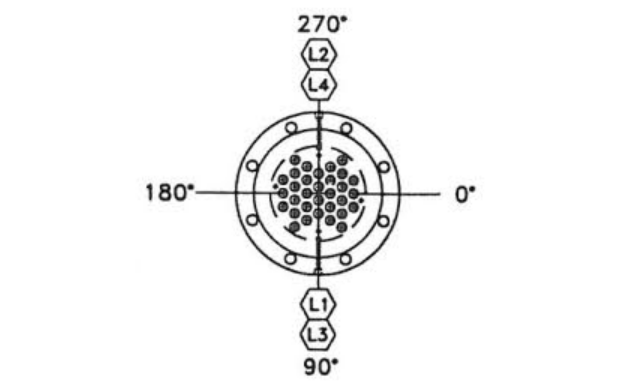
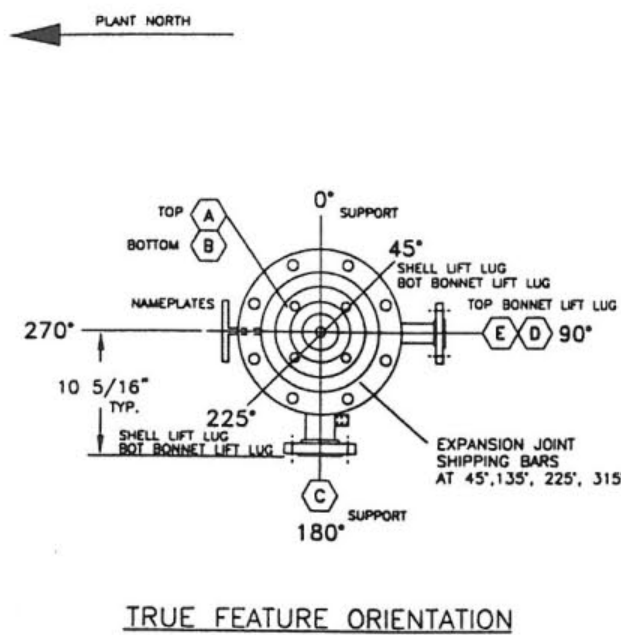




NOZZLE SCHEDULE

MARK	QTY.	SIZE	RATING	TYPE	SERVICE
A	1	3"	150#	LJ	VAPOR INLET
B	1	1"	150#	LJ	LIQUID DRAIN
C	1	3"	150#	LJ	VAPOR OUTLET
D	1	1.5" X 3"	150#	LJ	COOLANT INLET
E	1	1.5"	150#	LJ	COOLANT OUTLET
L1-L4	4	1/8" NPT		TAPPED HOLE	T.S. LEAK DETECT

CERTIFIED FOR CONSTRUCTION
BY
AstroCosmos Metallurgical, Inc.
BY *Steve Banta* DATE *4/2/99*

DRAWING REVISIONS

NO.	BY	DATE	DESCRIPTION
2			
1	TJ	3/24/99	PER CUSTOMER APPROVAL

APPROVED
THIS APPROVAL IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT. IT IS NOT MEANT TO BE AN APPROVAL OF THIS SUBMITTAL'S DIMENSIONS OR FABRICATION DETAILS.
Quayle DATE: *07/09/99*

- NOTES:
- BOLT HOLES TO STRADDLE CENTERLINES
 - ALL C.S. WELDS PER WPS ST-1.
 - DYE PENETRANT TEST ALL TA WELDS. HELIUM MASS SPECTROMETER, HALOGEN, AND HYDRO TEST.
 - PROVIDE PLATINUM SPOTS ON PROCESS SIDE OF TANTALUM, 18 SPOTS 1/2" DIA.
 - NOZZLE WELDS PER DWG. 67739-B-06
 - BLAST AND PAINT ALL EXPOSED CARBON STEEL WITH ONE COAT OF EPOXY PRIMER, 3 mil DFT.
 - PROVIDE PROTECTIVE COVERS FOR SHIPMENT. PLUG ALL TAPPED HOLES.
 - ALL COMPONENTS ARE ASBESTOS FREE.
 - PROVIDE PLASTIC COVER ON ALL OPEN FLANGED NOZZLES AND CAPS ON THE OTHER OPENINGS FOR SHIPMENT.
 - HEAT EXCHANGER IS DESIGNED AND FABRICATED TO OPERATE WITHIN THE FULL DESIGN TEMP. AND PRESSURE RANGE SPECIFIED AND CAN WITHSTAND CYCLIC CONDITIONS IN THIS RANGE.

DESIGN CONDITIONS

	SHELLSIDE	TUBESIDE
DESIGN AND FABRICATE PER ASME SECT. VIII, DIV. 1 1995 AND 1997 ADDENDA		
BEM CLASS "B"		
DESIGN PRESSURE	150 PSIG/FV	150 PSIG/FV
MAWP	150 PSIG/FV	150 PSIG/FV
DESIGN TEMPERATURE	350° F	350° F
MDMT	-20° F	-20° F
CORROSION ALLOW.	.0625	0
RADIOGRAPHY	NONE	NONE
EFFICIENCY	.70	.70
HYDRO TEST PRESS.	229 PSIG	229 PSIG

IMPACT TESTING NOT REQ'D PER UG-20(f), UCS-66(b,c)

WT. EMPTY = 520 # FULL H2O = 780 #

MATERIALS OF CONSTRUCTION

	SHELLSIDE	TUBESIDE
SHELL	SA-106-B	SA-106-B
TUBESHEETS / LINERS	SA-516-70	TANTALUM 2.5%W
BODY FLANGES	SA-105	SA-105
NOZZLE NECKS	SA-105	SA-105
NOZZLE FLANGES	SA-105	SA-105
BONNET LINERS/FACINGS		TANTALUM 2.5%W
SUPPORTS	SA-516-70	
BAFFLES	TEFLON (PTFE)	
GASKETS		PTFE ENVL.
STUDS / NUTS	SA-193-B7 / SA-194-2H	ZINC PLATED

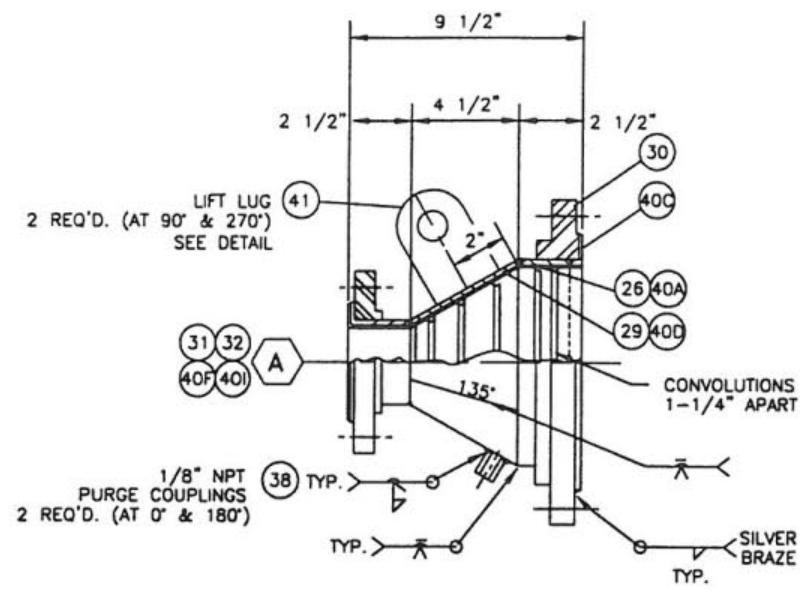
HEAT EXCHANGER DESCRIPTION

25 SQ. FT. BEM-8-1-48 VERT. HT. EXCH.
(32) 3/4"OD x .015" WALL TUBES (TANT. 2.5%W)
ON 1-1/8" TRIANGLE PITCH

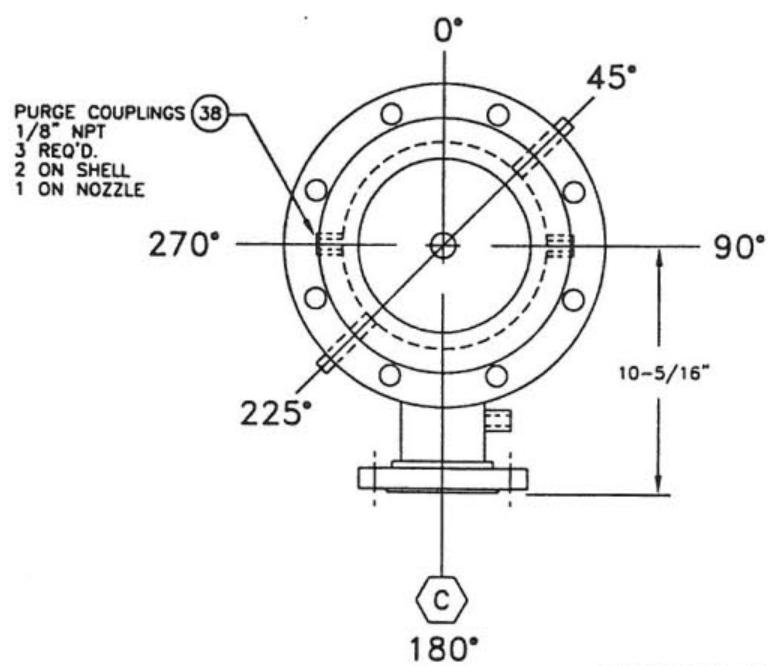
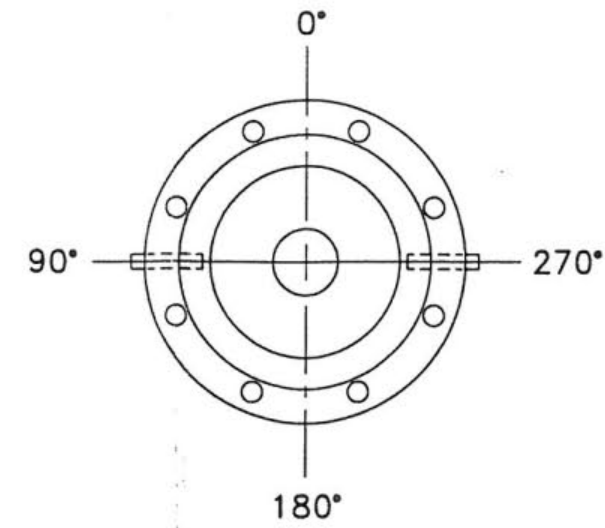
CUSTOMER: TORCON INC.
LOCATION: NOVARTIS BLDGS 425/426 CHAD PLANT
P.O. # 9818-01
ITEM: MAIN CONDENSER
EQUIP. # CD-0102
AstroCosmos S.O.# 67739

AC AstroCosmos Metallurgical, Inc.
CAMARILLO, CALIFORNIA 805-482-9825

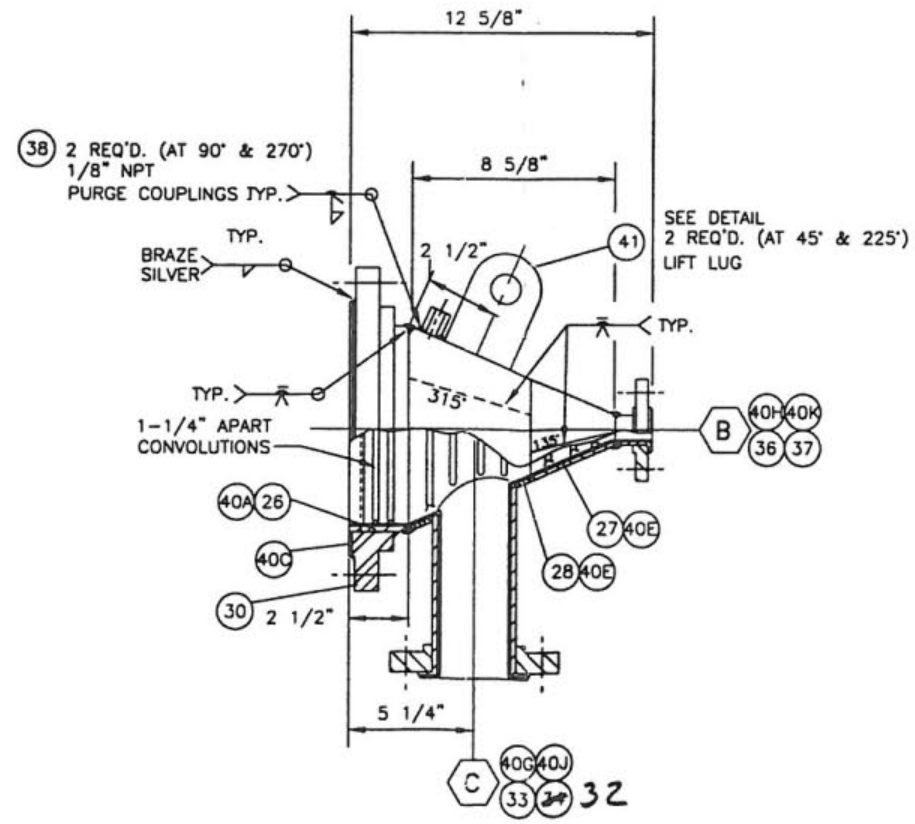
DWN DATE TJ 12/23/98
CHK'D DATE
APR 05 1999
BEM 8-1-48 VERTICAL HEAT EXCHANGER
SCALE NONE
DRAWING NO. 67739-D-01
REV. 1



TOP BONNET DETAIL



BOTTOM BONNET DETAIL



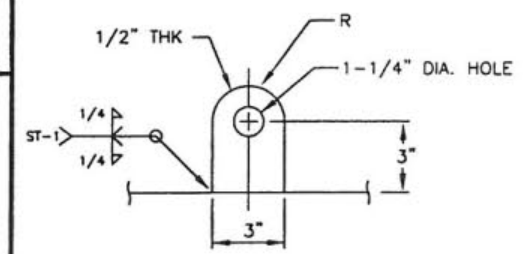
APPROVED
THIS APPROVAL IS ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT. IT IS NOT MEANT TO BE AN APPROVAL OF THIS SUBMITTAL'S DIMENSIONS OR FABRICATION DETAILS.
[Signature] DATE: 07/09/99

NO.	BY	DATE	DESCRIPTION
3			
2			
1	TJ	3/25/99	PER CUSTOMER APPROVAL
DRAWING REVISIONS			

NOZZLE SCHEDULE						
MARK	QTY.	SIZE	RATING	TYPE	SERVICE	
A	1	3"	150#	LJ	VAPOR INLET	
B	1	1"	150#	LJ	VAPOR OUTLET	
C	1	3"	150#	LJ	LIQUID DRAIN	

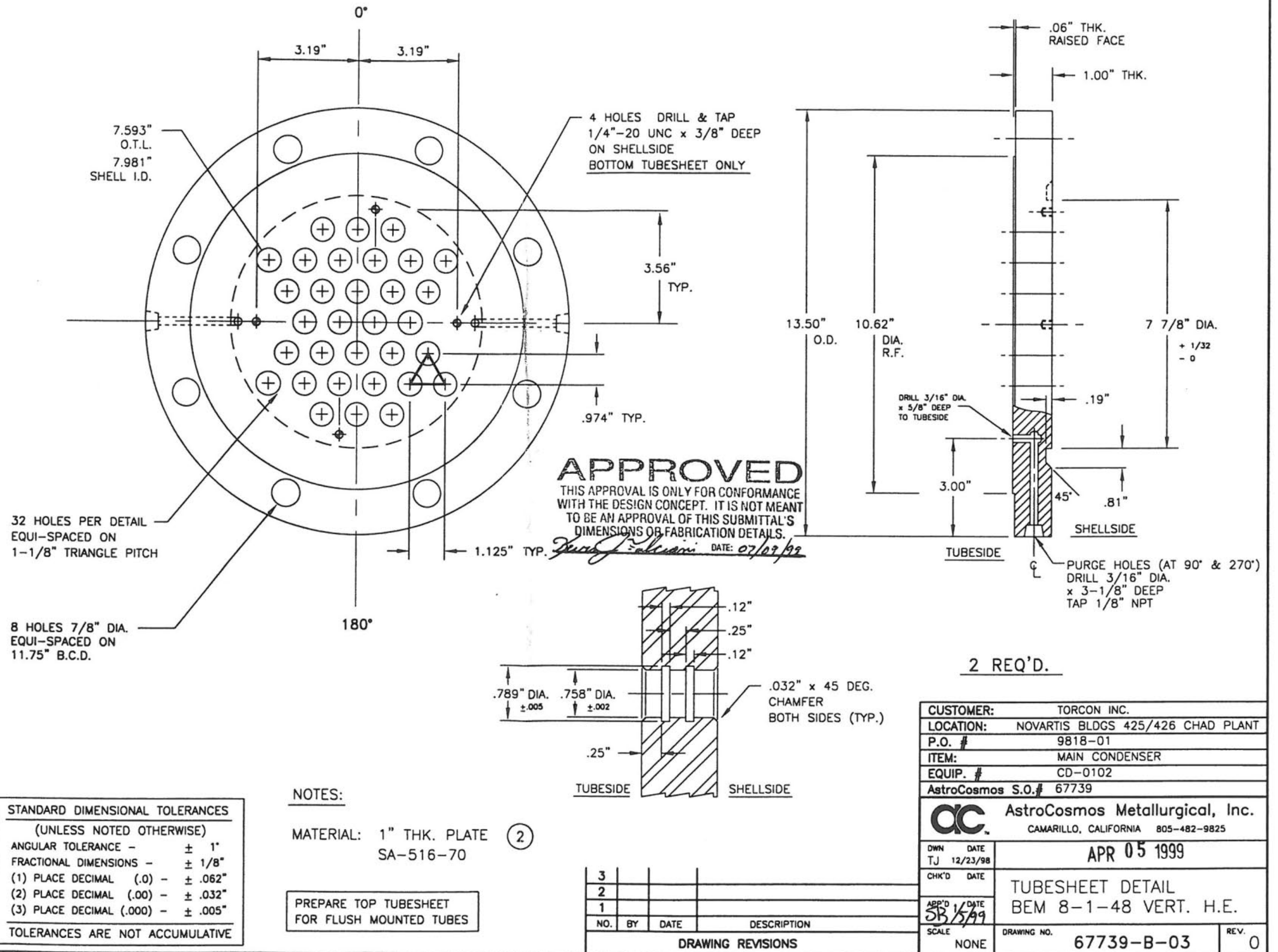
NOTES:
SEE NOTES ON DWG. 67739-D-01

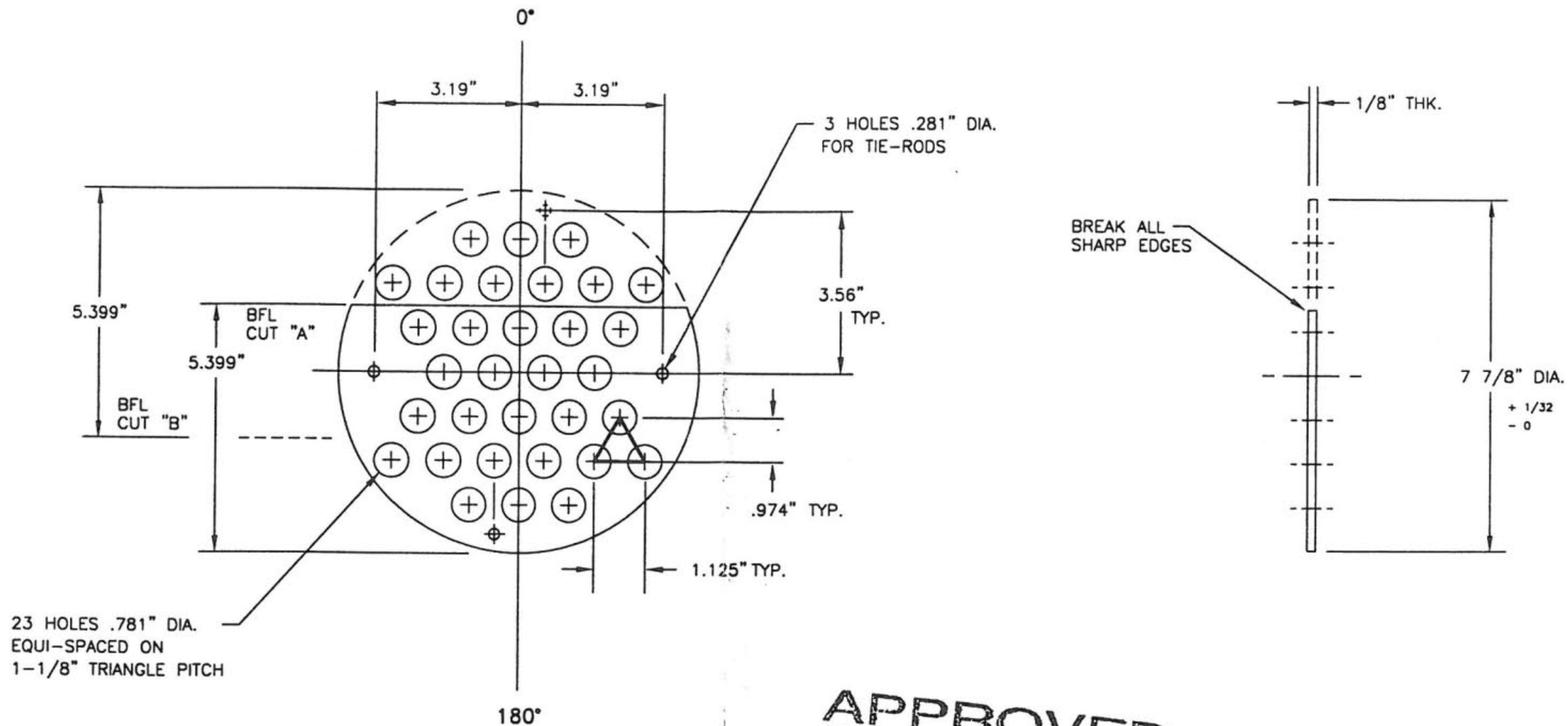
STANDARD DIMENSIONAL TOLERANCES (UNLESS NOTED OTHERWISE)	
ANGULAR TOLERANCE -	± 1°
FRACTIONAL DIMENSIONS -	± 1/8"
(1) PLACE DECIMAL (.0) -	± .062"
(2) PLACE DECIMAL (.00) -	± .032"
(3) PLACE DECIMAL (.000) -	± .005"
TOLERANCES ARE NOT ACCUMULATIVE	



LIFT LUG DETAIL (41)
4 REQ'D

CUSTOMER:		TORCON INC.	
LOCATION:		NOVARTIS BLDGS 425/426 CHAD PLANT	
P.O. #		9818-01	
ITEM:		MAIN CONDENSER	
EQUIP. #		CD-0102	
COSMOS S.O. #		67739	
AC		AstroCosmos Metallurgical, Inc.	
		CAMARILLO, CALIFORNIA 805-482-9825	
DWN	DATE	APR 05 1999	
TJ	12/23/98		
CHK'D	DATE	BEM 8-1-48 VERT. H.E. BONNET DETAILS	
APP'D	DATE		
SCALE	DATE		
DRAWING NO.		67739-B-02	
REV.		1	





- NOTES:
- MATERIAL: 1/8" THK. SHEET PTFE (20)
- 9 REQ'D.
- (5) CUT AT "A" (AS SHOWN)
- (4) CUT AT "B"

STANDARD DIMENSIONAL TOLERANCES

(UNLESS NOTED OTHERWISE)

ANGULAR TOLERANCE -	± 1°
FRACTIONAL DIMENSIONS -	± 1/8"
(1) PLACE DECIMAL (.0) -	± .062"
(2) PLACE DECIMAL (.00) -	± .032"
(3) PLACE DECIMAL (.000) -	± .005"

TOLERANCES ARE NOT ACCUMULATIVE

APPROVED
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WITH THE DESIGN CONCEPT. IT IS NOT MEANT
TO BE AN APPROVAL OF THIS SUBMITTAL'S
DIMENSIONS OR FABRICATION DETAILS.
Henry J. Salciani DATE: 02/02/99

NO.	BY	DATE	DESCRIPTION
3			
2			
1			
DRAWING REVISIONS			

CUSTOMER: TORCON INC.	
LOCATION: NOVARTIS BLDGS. 425/426 CHAD PLANT	
P.O. #	9818-01
ITEM:	MAIN CONDENSER
EQUIP. #	CD-0102
AstroCosmos S.O.# 67739	
 AstroCosmos Metallurgical, Inc. CAMARILLO, CALIFORNIA 805-482-9825	
OWN DATE TJ 12-23-98	APR 05 1999
CHK'D DATE	BAFFLE DETAIL BEM 8-1-48 VERT. H.E.
APP'D DATE SB 1/5/99	DRAWING NO. 67739-B-05
SCALE NONE	REV. 0

